

CLAIMS

1. A receiver (20) for optical communications including:
 - 5 at least one primary optical detector (12) for receiving radiation from a radiation beam (16a) when the radiation beam is aligned with the primary optical detector (12), and
 - 10 at least one auxiliary optical detector (15a) arranged to receive radiation from the radiation beam (16b) when the radiation beam is not aligned with the primary optical detector (12),
 - 15 characterised in that the receiver (20) further includes a diffuser (13; 71) for redirecting radiation towards the auxiliary detector.
 2. A receiver according to claim 1 including a focusing element (11; 70) for focusing the incoming radiation beam (16b) onto the primary optical detector and/or the diffuser.
 3. A receiver according to claim 2 including a receiver system (21) for retrieving data from redirected radiation received at the auxiliary detector.
 - 20 4. A receiver according to any preceding claim wherein the diffuser is a reflector and is arranged to face substantially in the same direction as the primary detector to reflect incoming radiation not aligned with the primary detector, and the auxiliary detector is arranged to substantially face the diffuser.
 - 25 5. A receiver according to claim 4 wherein the diffuser is arranged in substantially the same plane as the primary detector, and the diffuser and primary detector are positioned in or in proximity to the focal plane of the focusing element.
 - 30 6. A receiver according to claim 2 including a control system (22, 23) connected to the auxiliary detector for aligning the primary detector with

respect to the radiation beam in at least one direction based on the intensity of radiation received at the auxiliary detector.

7. A receiver according to claim 6 wherein the control system aligns
5 the primary detector with the radiation beam by moving the primary detector.

8. A receiver according to claim 6 or 7 further including a redirecting element arranged in the path of the incoming beam, wherein the control system aligns the primary detector with the radiation beam by moving the element.
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9. A receiver according to any preceding claim including at least one pair of auxiliary detectors (15a, 15b), each auxiliary detector being arranged to output current dependent on the intensity of received radiation, and the receiver includes means for calculating misalignment of the primary detector with respect to the radiation beam based on the output signals of each auxiliary detector (15a, 15b).
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10. A receiver according to claim 9 including two pairs of auxiliary detectors, wherein the calculating means is connected to both pairs of detectors for calculating misalignment of the primary detector with respect to the radiation beam in two substantially perpendicular directions.
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11. An optical network including a plurality of nodes, a first said node including a receiver according to any preceding claim and a second said node including a transmitter for transmitting a radiation beam to be received by said receiver.
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12. An optical network according to claim 11, said first node including both a transmitter for transmitting a radiation beam and a receiver and said second node including a receiver, wherein the first node is arranged to align the radiation beam output from the transmitter on the first node with respect to
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the receiver on the second node, based on a signal output from the receiver in said first node.

13. An optical network according to claim 11 or 12 wherein the
5 second node is arranged to transmit a relatively narrow divergence data beam
and relatively wide divergence auxiliary beam, and wherein the receiver in the
first node is arranged to align the primary detector with respect to the auxiliary
radiation beam.

10 14. An optical network according to claim 13 wherein the network is
arranged such that aligning the primary detector with respect to the auxiliary
radiation beam also aligns the primary detector with the data beam from the
second node.

15. 15. A receiver (20) for optical communications including:
at least one primary optical detector (12) for receiving an
incoming radiation beam,
a redirecting surface (13) for redirecting an incoming radiation
beam (16b),
20 at least one pair of auxiliary optical detectors (15a, 15b) arranged
to receive redirected radiation from the surface (13), and
a control system connected to the auxiliary detectors (15a, 15b)
for aligning the primary detector (12) and the incoming radiation beam (16b) in
at least one direction,
25 characterised in that the surface (13) is a diffuser and the control
system aligns the primary detector (12) and radiation beam (16b) based on the
intensity of redirected radiation received at the auxiliary detectors (15a, 15b).